

A Study on Spatial Variation of Health Infrastructure of District North 24 Parganas of West Bengal

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Abstract: Proper infrastructure of health is the main pillar of health care system of any nation. The quality of health services people receive will totally depends on the existing health infrastructure of the region. According to census 2011 North 24 Parganas district is the largest district of West Bengal in terms of total population but according to district's Human Development Report average per capita Income is lower than West Bengal's average. In this context an attempt has been made to study spatial variation of health infrastructure of North 24 Parganas district of West Bengal. For this only government health services have been taken into consideration. The objectives of the study are to explore spatial distribution of health infrastructures at sub division level and C D Block and Municipality levels. Secondly, to compare few health care facilities between C D Blocks (non- municipal areas) and Municipal areas. Lastly to rank CD Blocks and Municipal areas separately on the basis of health infrastructures. Parameters taken into consideration for this purposes are number of hospitals, rural hospitals, block primary health care centres, Primary health centres, sub centres, family welfare centres, beds and doctors. To do this secondary data have been obtained from District Statistical Hand Book of North 24 Parganas District 2013. Suitable statistical techniques like mean, standard deviation have been used here. Bar charts have been prepared for graphical representation of distribution of parameters. For ranking of CD Blocks and Municipalities score values have been calculated separately for C D Blocks and Municipalities. It has been found that there exist tremendous population pressure on the existing health infrastructure provided by government. Remarkable disparity regarding the distributions of health infrastructure have been found.

Keywords: Health infrastructure, disparity, hospitals, primary health care centres, sub centres, family welfare centres, beds, doctors.

1. INTRODUCTION

Good health can be described as one's personal asset and it is very much related to health infrastructure of a region. Good healthcare infrastructure is required keeping people fit and safe when they are sick. Proper health infrastructure is needed to combat both emergency situation and for prevention from various diseases. This infrastructure is the main pillar of health care system of any nation. The quality of health services people receive will totally depends on the existing health infrastructure of the region. Bhole Committee known as Health Survey and Development Committee published a report on 1946. This report is the pioneer report depending on which succeeding health policies and reports have been developed in India. This report recommended the concept of three-tiered health care system. This report also recommended fetching health workers under the pay roll of government. It was tried to give access of primary health care to every people irrespective of their socio-economic condition. In 1983 the first National Health Policy of India (NHP) emphasized that the provision of primary health care to be given to all by 2000 (Chokshi M, et al., 2016). Being the populous country India has varied social, economic political individuals. Disparities in economic, regional and gender are very much obvious. This disparities influences health sectors (Patil A. V, et al., 2002). Since independence governments are continuously promising to restructure India's poor health care system. Government is now promising to expand health assurance for all (Patel V, et al., 2015). This promise is very similar to WHO's motto i.e. 'health for all', 'millennium developmental goals' and more recently 'universal health care' (Bhardwaj S, et al., 2018). Although there are many thriving and assurance to curtail down gaps by introducing good health care system, still there exist spatial disparities (Patel V, et al., 2015). Now there are many health care organizations which are governed and financed by the government like central government or by state government. Apart from this there are many non-government organizations which are self-financed (Rudrappa S, et al., 2019). For the development and to ensure of effective health care National Rural Health Mission (NRHM) was launched in 2005 by the central government. In rural areas where lion's share of population are residing there are very few health care institutions and most of these are devoid of medical facilities (Kumar A,

Gupta S, 2012). It has been found that that urban areas support about 75% of facilities like infrastructure, human resource and other health related facilities where only 27% dwellers reside here (Patil A. V, et al., 2002). Urban health care system is also an area of concern for the nation. The health conditions of urban poor's are very much vulnerable (Kumar S, et al., 2016). To overcome this situation National Urban Health Mission (NUHM) was initiated in 2013 aiming to meet the need of health care for poor urban people. Urban poor's are also unable to get good health facilities due to various constraint and this make an environment of isolation to health care services among them (Mistry D, Basu R, 2014). Many efforts have been made by taking various projects to overcome hurdles faced by urban poor's in terms of receiving health care facilities but these are not enough to meet challenges. Challenges includes receiving standardized health services, over pressure on urban health facilities etc. (Kumar S, et al., 2016). Another important challenge which faces both rural and urban area is the lacunas between the allocation of government funds to health care systems and government monitoring (Kumar A, Gupta S, 2012). Various works on health study of West Bengal covering its different aspects like public health facilities, its efficiency, inequality etc. shows that the infra-structure or system are not satisfying. One study states about low efficiency of health system of West Bengal. It has been found there that there exist disparities for availability and utilization of per capita health facilities in the state of West Bengal (Purohit B. C, 2008). There is another study on health system on district Burdhaman. It portrays disparity of health system between rural to urban even rural to rural and urban to urban areas (Bose S, Basu R, 2009). Another study on health services on Medinipur district shows remarkable disparity regarding health services (Ghosh A. R, 2010). One study reveals that in rural west Bengal there exist gap between existing and desirable facilities of health care system. It also shows that over time disparity increase in terms of sub-centers and beds. (Bhattacharya G, Haldar S. K, 2014).

North 24 Parganas district is the largest district in terms of total population accommodating 10.97 percent of total population of West Bengal (Census 2011). According to District Human Development Report 2001 average per capita Income of the district was 14768.32 which was lower than West Bengal's average per capita Income which was 16072.26 (Human Development Report 2001). In this context an attempt has been made to study spatial variation of health care infrastructure of North 24 Parganas district of West Bengal. Here only government provided health infrastructures have been considered.

1.1 Objectives

The objectives of the study are:

- To explore spatial distribution of health infrastructures for CD Blocks (non- municipal areas) and to compare Subdivisions on the basis of available health infrastructural facilities.
- To explore spatial distribution of health infrastructures for Municipal areas and to compare Subdivisions on the basis of available health infrastructural facilities.
- To compare C D Blocks (non- municipal areas) and Municipal areas on the basis of comparable health infrastructural facilities.
- To rank CD Blocks and Municipal areas separately on the basis of available health infrastructures.

1.2 Database and Methodology

The present study is based on secondary data obtained from District Statistical Hand Book of North 24 Parganas District 2013. Parameters taken into consideration for this purposes are number of hospitals, rural hospitals, block primary health care centres, Primary health centres, sub centres, family welfare centres, beds and doctors. Among these numbers of rural hospitals, block primary health care centres, Primary health centres, sub centres, family welfare centres, beds and doctors have been taken to study the condition of C D Blocks. For studying conditions of Municipalities as per availability of data numbers of hospitals and beds have been considered here.

Suitable statistical techniques have been applied for this study purposes. Bar charts have been prepared for graphical representation of distribution of parameters. To measure central tendency mean has been calculated. It is the simple average of different values of variables (Mahmood A, 2002). Dispersion of parameters have been tested by applying standard deviation. It is the square root of the arithmetic mean of squares of deviations from arithmetic mean (Das N G, 2001).

For ranking of CD Blocks and municipalities score values have been calculated separately. In this regard methodology adopted by Ghosh (2010) has been followed. To do this total number of health facilities e.g. total number of Rural Hospital, Block Primary Health Centre (BPHC), Primary Health Centre (PHC), Bed, Doctor, Sub Centre, Family welfare Centre(for CD Blocks) and Hospital and Bed (for municipalities) have been calculated separately. Then threshold of population have been calculated for each parameter. To do this total population have been divided by total number of each parameter. Thus numbers of population served by each parameters or threshold value of population for each parameter have been calculated. Then lowest value of threshold population among parameters has been taken as the standard value and then threshold population of each parameter have been divided by the standard values to get the scores for each parameter. Then these score values have been multiplied by number of facility available for each place. Thus the score obtained from each parameter have been added to get final score of an area. On the basis of total score C D Blocks (non - municipal areas) and municipalities have been ranked separately.

1.3 Study Area

The district covers an area of 4094 sq. Km. having 10009781 populations of which 42.73% are rural and 57.27% are urban (District Statistical Handbook, 2013). The district consists of 5 Subdivisions, 22 blocks, 44 police stations, 27 municipalities. Five Subdivisions are Bongaon Subdivision, Barasat Subdivision, Barrackpur Subdivision, Bidhannagar Subdivision and Bashirhat Subdivision. In Bongaon Subdivision percentage of non-municipal areas are higher than municipal areas. There are 3 C.D Blocks and 1 Municipality. In Barasat Sub division non-municipal areas are slightly higher than municipal areas. There are 7 C.D Blocks and 6 municipalities. In Barrackpur Subdivision non-municipal areas are much lower than municipal areas. Here there are only 2 C.D Blocks and 16 Municipalities. In Bidhannagar Subdivision comprises by only 1 municipal area. Bashirhat Subdivision consists of 10 C.D Blocks and 3 municipalities.

Thus non-municipal areas are more in numbers in Bashirhat Sub Division followed by Barasat Subdivision, Bongaon Subdivision and Barrackpur Subdivision. There is no C D Blocks under Bidhannagar Subdivision. Municipal units are in large numbers in Barrackpur Subdivision followed by Barasat Subdivision, Bashirhat Subdivision.

2. DISCUSSION AND ANALYSIS

Hospitals are Institution from where sick or distressed people get medical facilities. Surgery is common here. Patients stay here to receive nursing care. Primary Health centres minimize the pressure of hospitals. This unit provides patients to get facility to improve their quality of life (Agarwal R, et al., 2017). A Primary health center has to look after 30,000 population in plain areas (Bhardwaj S, et al., 2018). The sub centres are the first entry point where people first steps into primary health care system. It is the marginal institutions (Bhandari L, Dutta S, 2007). It has to serve 5,000 populations in the plain regions (Bhardwaj S, et al., 2018). Family welfare centres are aiming to provide services to people related to family well-being. People get these services assisted by government. Beds are related to institutions. Lastly doctors are indispensable part of health care infrastructure.

2.1 Spatial distribution of health infrastructures in CD Blocks (non – Municipal areas)

2.1.1 Rural Hospitals, Block Primary Health Centres and Primary Health Centres

There are seven Rural Hospitals in CD Blocks of the district and they are equally distributed over seven blocks viz. Bagdah, Barasat, Baduria, Minakhan, Swarupnagar, Hansnabad and Sandeshkhali II blocks (Fig -1). Population threshold value for this infrastructural unit is 717079 (Table- 4).

Total numbers of Block Primary Health Centers of the district's C D Block are fifteen and they are also equally distributed over fifteen CD blocks. Threshold of population these are serving are 334637 (Table- 4). Bagdah, Barasat II, Baduria, Minakhan, Swarupnagar, Hansnabad and Sandeshkhali II are CD Blocks where Block Primary Health Centers are absent. District's total numbers of Primary Health Centers in C D Blocks are fifty and these are present in every C D Blocks. For Primary Health Centers value of Population threshold is 100391 (Table- 4). In Baduria the number of Primary Health Centers are maximum i.e. four centers (8%) are found here and in Habra I the number is low i.e. one (2%) (Fig -1).

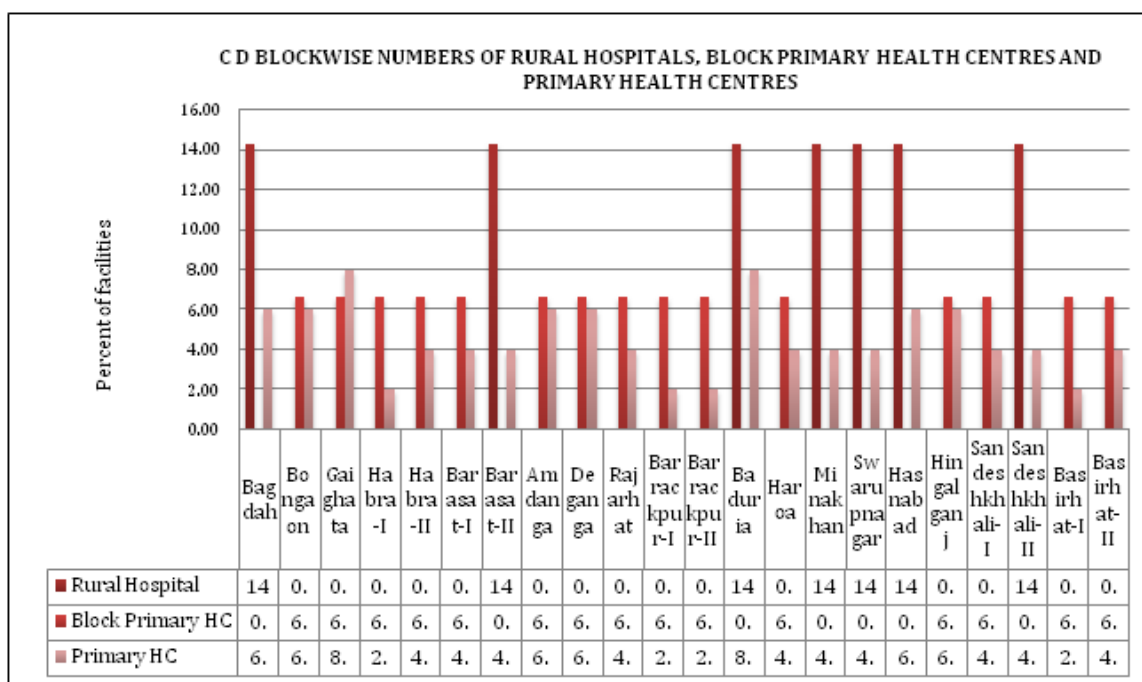


Fig- 1: Source: District Statistical Hand Book, 2013

2.1.2 Family Welfare Centres and Sub centres

Numbers of Family Welfare Centers registered in C D Blocks of the district are seventy two and these are present in each C D Blocks. Threshold value of population for this unit is 69716 (Table- 4). In Baduria and Gaighata the number of Family Welfare Centers are maximum in numbers i.e. five centers (6.94%) are found in each block. In Habra, Barrackpur I, Barrackpur II and Bashirhat I the number is low i.e. two (2.78%) (Fig -2).

Numbers of Sub Centers recorded in C D Blocks of the district are seven forty two and these are present in every C D Blocks. This unit serves 6765 population as threshold (Table- 4). In Bongaon the number of Sub Centers are maximum in number i.e. fifty five centers (7.41%) are found here and in Bashirhat I the number is low i.e. nineteen (2.56%)(Fig -2).

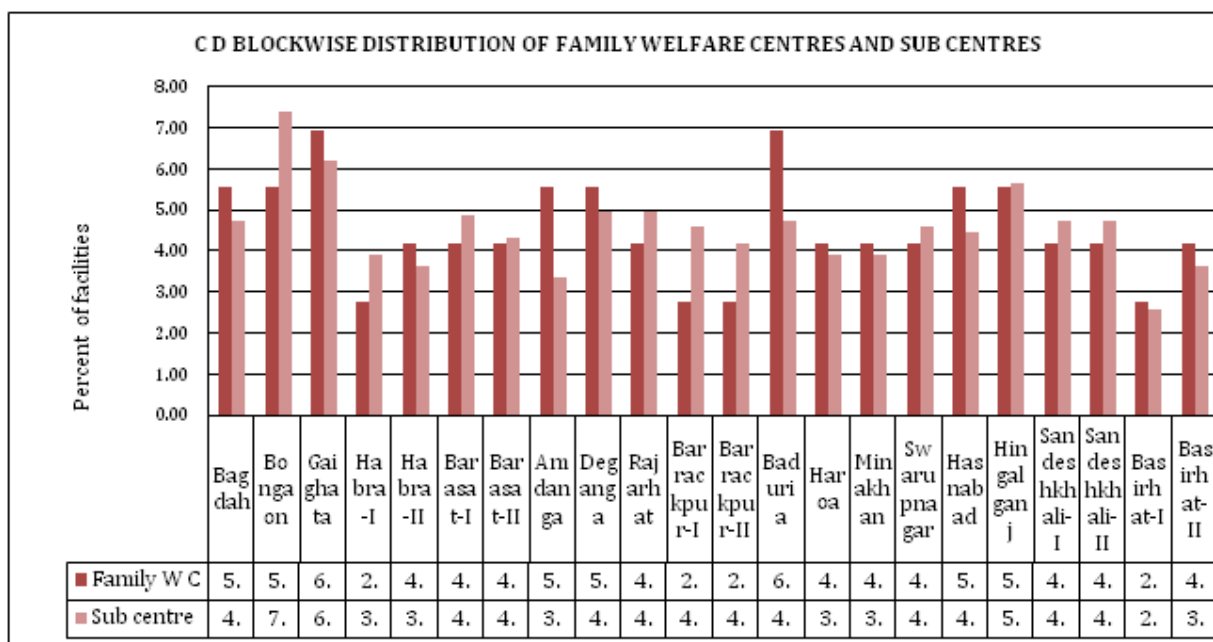


Fig- 2: Source: District Statistical Hand Book, 2013

2.1.3 Beds and Doctors

Total numbers of existing Beds found in CD Blocks of the districts are 978. Population threshold value for Beds is 5132 (Table- 4). Baduria's condition is better in terms of existing Beds. The numbers are 88 (9.00%). In Bongaon the number of Beds are low i.e. 24 (2.45%) (Fig -3).

According to World Health Organization norm, doctor-to population ratio should be 1: 1,000 but India has only 1: 1,674 resulting in the acute shortage and uneven distribution of doctors (Bhardwaj S, et al., 2018). In this area there are in total 154 Doctors listed in CD Blocks. So here population threshold value for doctor is 32595 (Table- 4). It is far beyond the value of India's average. In Baduria the number of Doctors are high i.e. sixteen (10.39%) and in Barrackpur I and Barrackpur II the number is low i.e. four (2.60%) in each (Fig -3).

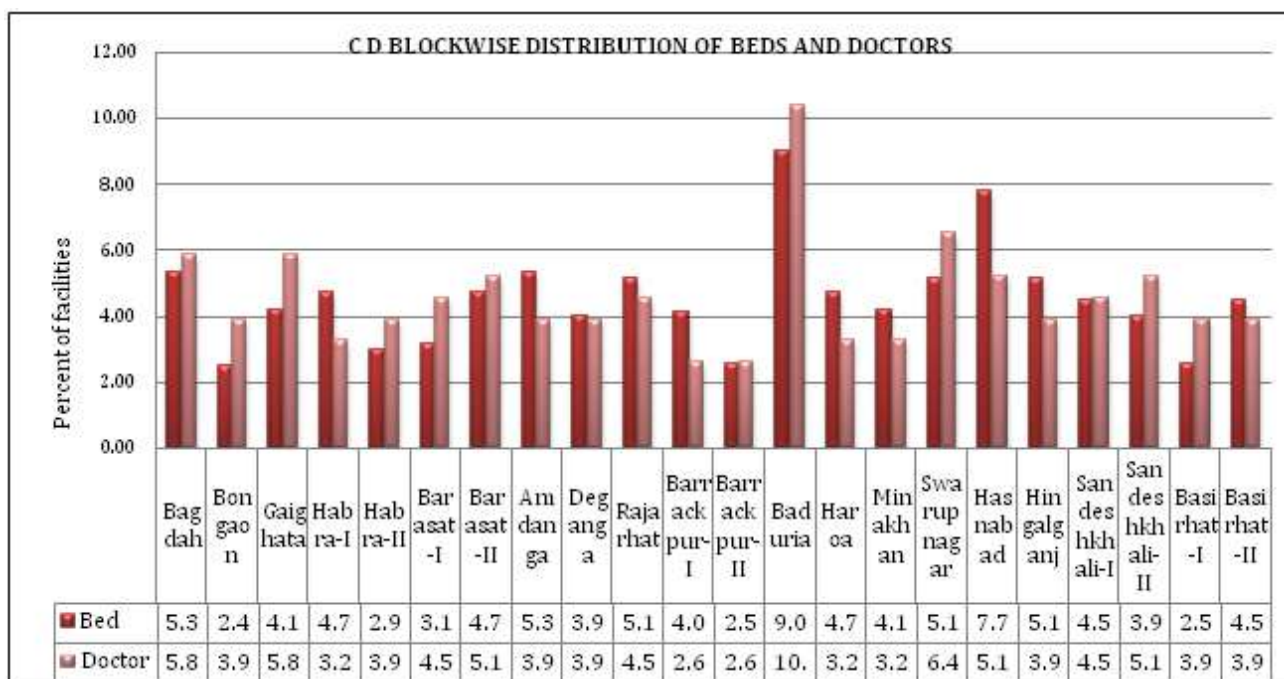


Fig- 3: Source: District Statistical Hand Book, 2013.

2.1.4 Sub division wise comparison

In this section sub divisions have been compared according to available health infrastructure considering C D Blocks. It has been stated before that in this district there are 22 C D Blocks and 5 Sub divisions. As there is no C D Block under the jurisdiction of Bidhannagar Subdivision, these 22 C D Blocks has been distributed under rest of four sub divisions. So four Subdivisions except Bidhannagar sub division can be compared. Sub Divisions wise mean, range and standard deviation are calculated for each parameters for C D Blocks.

Rural hospitals are found only in three Subdivisions except Barrackpur sub division. Mean values of rural hospitals reveal that it is high in Bashirhat Subdivision where mean is 0.50, followed by 0.33 i.e. in Bongaon sub division and 0.14 i.e. in Barasat sub division and 0 i.e. in Barrackpur Subdivision. Value of standard deviation is high in Bongaon Subdivision where 0.58 followed by Bashirhat Subdivision i.e. 0.53 and Barasat Subdivision i.e. 0.38. So consistency of rural hospitals is high in Bongaon Subdivision and low in Barasat Subdivision (Table- 1).

Block Primary health centers are found in all Subdivisions. Mean values of Block Primary health centers for each Subdivision reveals that it is 1.00 in Barrackpur Subdivision, followed by 0.86 in Barasat Subdivision, 0.67 in Bongaon Subdivision and 0.50 in Bashirhat Subdivision. Value of standard deviation is high in Bongaon Subdivision i.e. 0.58 followed by Bashirhat Subdivision i.e. 0.53 and Barasat Subdivision i.e. 0.38 and in Barrackpur Subdivision i.e. 0. In Barrackpur Subdivision the standard deviation value is 0 as the number of Block Primary health center is same in each C D Block. So consistency of Block Primary health centers is high in Bongaon Subdivision and there is no variability in Barrackpur Subdivision (Table- 1).

Mean values of Primary health centers for four sub divisions reveal that it is 3.33 in Bongaon Subdivision, followed by 2.30 in Bashirhat Subdivision, 2.14 in Barasat Subdivision and 1.00 in Barrackpur Subdivision. Value of standard deviation is high in Bashirhat Subdivision i.e. 0.82 followed by Barasat Subdivision i.e. 0.69 and Bongaon Subdivision i.e. 0.58 and Barrackpur Subdivision i.e. 0. In Barrackpur sub division the standard deviation value is 0 as the number of Primary health center is same in each C D Block. So consistency of Primary health centers is high in Bashirhat Subdivision and there is no variability in Barrackpur Subdivision (Table- 1).

Family welfare centers are found in each Subdivisions. Mean values of which are found are 4.33 in Bongaon Subdivisions, followed by 3.30 in Bashirhat Subdivisions, 3.14 in Barasat Subdivisions and 2.00 in Barrackpur sub division. Value of standard deviation is high in Bashirhat i.e. 0.82 followed by Barasat i.e. 0.69, and Bongaon i.e. 0.58. and Barrackpur i.e. 0. Again in Barrackpur Subdivision the standard deviation value is 0 as the numbers of Family Welfare centers are same in each C D Block. So consistency of Family Welfare centers is high in Bashirhat Subdivision and there is no variability in Barrackpur Subdivision (Table- 1).

Mean values of Sub centers for four sub divisions reveal that it is 45.33 in Bongaon sub division, followed by 32.50 in Barrackpur sub division, 31.86 in Barasat sub division and 31.80 in Bashirhat sub division. Value of standard deviation is high in Bongaon Subdivision i.e. 10.02 followed by Bashirhat Subdivision i.e. 6.18, Barasat Subdivision i.e. 4.98 and 2.12 in Barrackpur Subdivision. So consistency of Sub centers are high in Bongaon Subdivision and low in Barrackpur Subdivision (Table- 1).

Mean values of Beds reveal that it is 50.30 in Bashirhat Subdivision, followed by 41.86 in Barasat Subdivision and 39.00 in Bongaon Subdivision and 32.50 in Barrackpur Subdivision. Value of standard deviation is high in Bashirhat Subdivision i.e. 18.36 followed by Bongaon Subdivision i.e. 14.11, Barrackpur Subdivision 10.61 and Barasat Subdivision i.e. 9.08. So consistency of beds are high in Bashirhat sub division and low in Barasat Subdivision (Table- 1).

Subdivision wise mean values of doctors reveal that it is 8.00 in Bongaon Subdivision, followed by 7.70 in Bashirhat Subdivision, 6.43 in Barasat Subdivision and 4.00 in Barrackpur Subdivision. Value of standard deviation is high in Bashirhat Subdivision i.e. 3.30 followed by Bongaon Subdivision i.e. 1.73, Barasat Subdivision i.e. 0.98 and Barrackpur Subdivision i.e. 0. In Barrackpur sub division the standard deviation value is 0 as the number of doctor is same in each C D Block. So consistency of beds are high in Bashirhat Subdivision and there is no variability in Barrackpur Subdivision (Table- 1).

Table-1: Source: District Statistical Hand Book, 2013.

<i>Sub divisions</i>	<i>Statistics</i>	<i>Rural Hospital</i>	<i>Block Primary HC</i>	<i>Primary HC</i>	<i>Family welfare Centre</i>	<i>Sub centre</i>	<i>Bed</i>	<i>Doctor</i>
Bongaon	Mean	0.33	0.67	3.33	4.33	45.33	39.00	8.00
	SD	0.58	0.58	0.58	0.58	10.02	14.11	1.73
Barasat	Mean	0.14	0.86	2.14	3.14	31.86	41.86	6.43
	SD	0.38	0.38	0.69	0.69	4.98	9.08	0.98
Barrackpur	Mean	0.00	1.00	1.00	2.00	32.50	32.50	4.00
	SD	0.00	0.00	0.00	0.00	2.12	10.61	0.00
Bashirhat	Mean	0.50	0.50	2.30	3.30	31.80	50.30	7.70
	SD	0.53	0.53	0.82	0.82	6.18	18.36	3.30

2.2 Spatial distribution of health infrastructures of Municipal areas

2.2.1 Hospitals and Beds

There are thirteen hospitals found in thirteen municipalities out of twenty seven municipalities of the district. Threshold population value for this is 382443 (Table- 6). They are equally distributed over thirteen municipalities viz. Bongaon, Habra, Ashoknagar- Kalyangar, Barasat, Naihati, Bhatpara, Barrackpur, Khardah, Panihati, Kamarhati, Baranagar, Bidhannagar and Basirhat municipalities. In all these municipalities there are 1 hospitals in each (Fig - 4).

It has been found that there are total 2407 beds in thirteen municipalities. Threshold value of population for bed is 2066 (Table- 6). In Barasat municipality concentration of beds are high in number i.e. 600 (24.93%) are there and in Ashokenagar - Kalyangar municipality the number is low i.e. 60(2.49%) (Fig – 4).

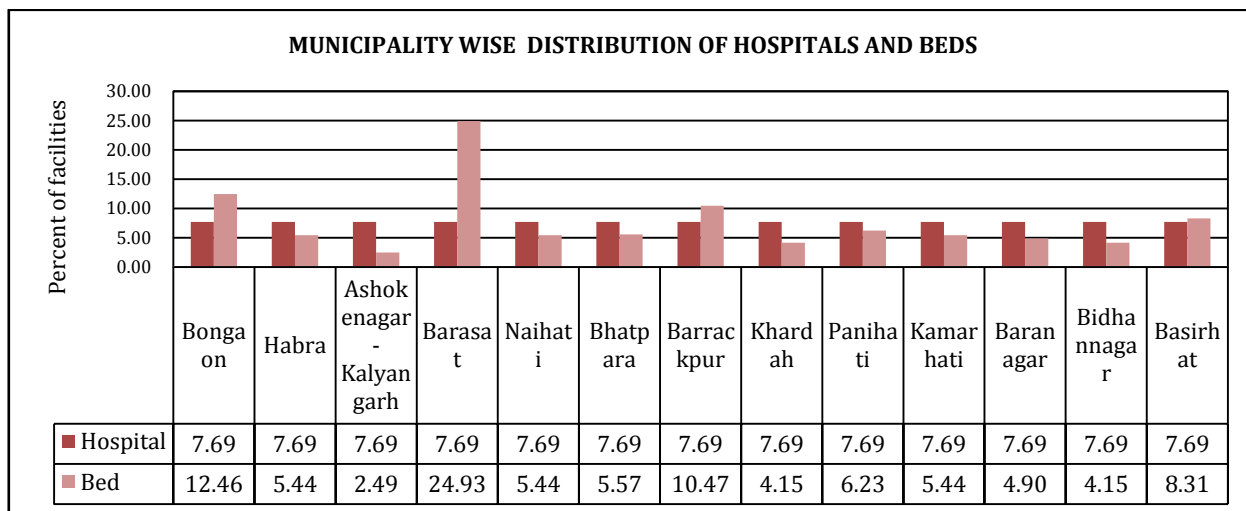


Fig- 4: Source: District Statistical Hand Book, 2013.

2.2.2 Sub division wise comparison

Sub Divisions wise mean and standard deviation have been calculated for each parameters for Municipalities.

Sub division wise mean values of hospitals reveal that it is high i.e. 1.00 in both Bongaon Subdivision and Bidhannagar Subdivisions. These areas are followed by Barasat Subdivision, Barrackpur Subdivision and Bashirhat Subdivision where mean values are 0.50, 0.44 and 0.33 respectively. Values of standard deviation for hospitals show that it is high in Bashirhat Subdivision, Barasat Subdivision and Barrackpur Subdivision where SD values are 0.58, 0.55 and 0.51 respectively. SD values are 0 in Bongaon Subdivision and Bidhannagar Subdivision as there are only one municipality in each of sub divisions. So consistency of hospital is high in Bashirhat Subdivision followed by Barasat Subdivision and Barrackpur Subdivision. In Bongaon Subdivision and Bidhannagar Subdivision there are no such variability regarding distribution of hospitals (Table-2).

Mean values of beds for all sub divisions reveal that it is high in Bongaon Subdivision where mean is 300. This is followed by 131.83 in Barasat Subdivision, 100 in Bidhannagar Subdivision, 66.67 in Bashirhat Subdivision and 63.50 in Barrackpur sub division. Values of standard deviation are high in Barasat Subdivision, followed by Bashirhat Subdivision and Barrackpur Subdivision where values are 235.15, 115.47 and 80.70 respectively. SD values are 0 in Bongaon Subdivision and Bidhannagar Subdivision as there are only one municipality in both of these areas. So consistency of bed is high in Barasat Subdivision, followed by Bashirhat Subdivision and Barrackpur Subdivision. In Bongaon Subdivision and Bidhannagar Subdivision there are no such variability regarding distribution of beds (Table-2).

Table-2: Source: District Statistical Hand Book, 2013.

Municipalities	Statistics	Hospital	Beds
Bongaon	Mean	1.00	300.00
	SD	0	0
Barasat	Mean	0.50	131.83
	SD	0.55	235.15
Barrackpur	Mean	0.44	63.50
	SD	0.51	80.70
Bidhannagar	Mean	1.00	100.00
	SD	0	0
Bashirhat	Mean	0.33	66.67
	SD	0.58	115.47

2.3 Comparison of C D Blocks (non- municipal areas) and Municipal areas

Table-3: Source: District Statistical Hand Book, 2013.

Places	Statistics	Hospitals	Rural Hospital	Bed
CD Blocks	Mean	-	0.32	44.45
	SD	-	0.48	15.12
Municipalities	Mean	0.48	-	89.15
	SD	0.51	-	134.22

Among variables taken only two factors can be compared from the existing data source. These are Hospitals and Beds as these two are common parameters.

It has been found that average numbers of hospitals are higher in municipal areas than non-municipal areas. It is 0.32 in C D Blocks and 0.48 in Municipalities. SD value of hospitals are high in municipal areas i.e. 0.51 than C D Blocks i.e. 0.48. So consistency of hospitals is high in Municipal areas than non – Municipal areas or C D Blocks (Table- 3)

Regarding beds it has been found that average numbers of beds are again high in Municipal areas i.e. 89.15 than non-municipal areas i.e. 44.45. SD value is almost nine times high i.e. 134.22 in municipal areas than non-municipal areas i.e. 15.12. So consistency is high in Municipal areas than non – Municipal areas or C D Blocks in terms of beds (Table- 3).

2.4 Ranking of areas

2.4.1 CD Blocks or non – municipal areas

As stated above in methodology section total scores of health facilities of C D Blocks have been derived. On the basis of this C D Blocks are ranked. It has been found that according to total score Baduria ranks first followed by Hansnabad, Bagdah, Swarupnagar, Gaighata, Barasat II, Sandesh khali II, Minakhan, Hingalganj, Bongaon, Deganga, Amdanga, Rajarhat, Sandeshkahali I, Barasat I, Basirhat II, Haroa, Habra II, Habra I, Barackpur I, Barackpur II and Basirhat I.(Fig -5)

Table-4: Source: District Statistical Hand Book, 2013.

Parameters	Total population	Total number of services	Population threshold for individual parameters	Scores
Rural Hospital	5019553	7	717079	139.71
Block Primary HC		15	334637	65.20
Primary HC		50	100391	19.56
Beds		978	5132	1.00
Doctors		154	32595	6.35
Subcentre		742	6765	1.32
Family welfare Centre		72	69716	13.58

Table-5: Source: District Statistical Hand Book, 2013.

C D Blocks	Rural Hospital	Block Primary Health Centre	Primary Health Centre	Bed	Doctor	Sub Centre	Family welfare Centre	Total Score
Bagdah	139.71	0.00	58.68	52.00	57.16	46.13	54.33	408.02
Bongaon	0.00	65.20	58.68	24.00	38.10	72.49	54.33	312.81
Gaighata	0.00	65.20	78.24	41.00	57.16	60.63	67.92	370.14
Habra-I	0.00	65.20	19.56	46.00	31.75	38.22	27.17	227.90
Habra-II	0.00	65.20	39.12	29.00	38.10	35.59	40.75	247.76
Barasat-I	0.00	65.20	39.12	31.00	44.45	47.45	40.75	267.97
Barasat-II	139.71	0.00	39.12	46.00	50.81	42.18	40.75	358.57
Amdanga	0.00	65.20	58.68	52.00	38.10	32.95	54.33	301.27
Deganga	0.00	65.20	58.68	39.00	38.10	48.77	54.33	304.09
Rajarhat	0.00	65.20	39.12	50.00	44.45	48.77	40.75	288.29
Barrackpur-I	0.00	65.20	19.56	40.00	25.40	44.81	27.17	222.14
Barrackpur-II	0.00	65.20	19.56	25.00	25.40	40.86	27.17	203.19

Baduria	139.71	0.00	78.24	88.00	101.61	46.13	67.92	521.61
Haroa	0.00	65.20	39.12	46.00	31.75	38.22	40.75	261.05
Minakhan	139.71	0.00	39.12	41.00	31.75	38.22	40.75	330.56
Swarupnagar	139.71	0.00	39.12	50.00	63.51	44.81	40.75	377.90
Hasnabad	139.71	0.00	58.68	76.00	50.81	43.50	54.33	423.03
Hingalganj	0.00	65.20	58.68	50.00	38.10	55.36	54.33	321.68
Sandeshkhali-I	0.00	65.20	39.12	44.00	44.45	46.13	40.75	279.66
Sandeshkhali-II	139.71	0.00	39.12	39.00	50.81	46.13	40.75	355.52
Basirhat-I	0.00	65.20	19.56	25.00	38.10	25.04	27.17	200.07
Basirhat-II	0.00	65.20	39.12	44.00	38.10	35.59	40.75	262.76

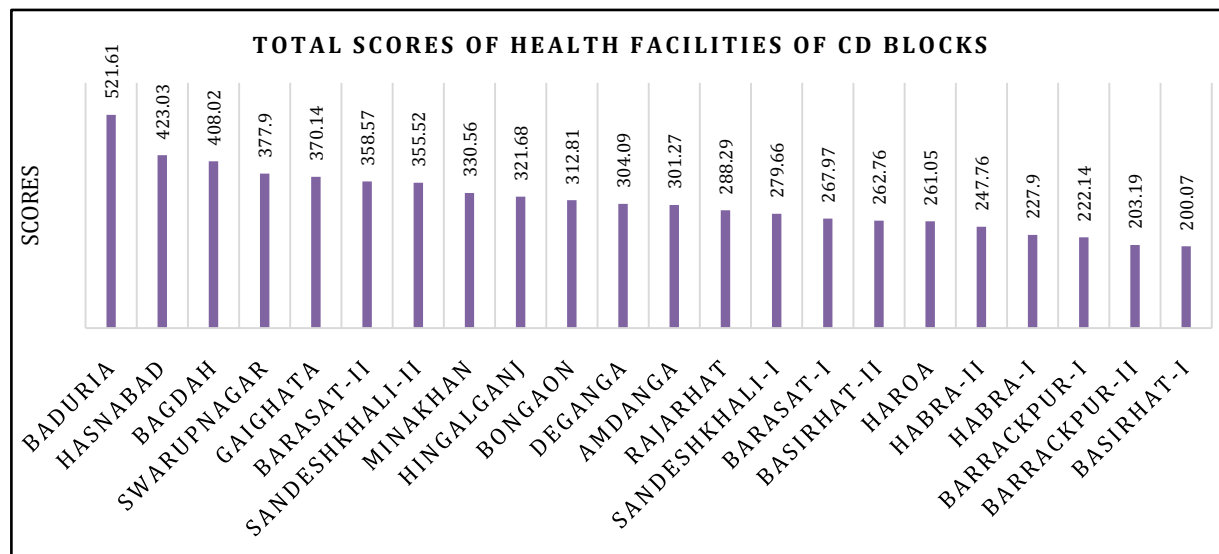


Fig-5: Source: District Statistical Hand Book, 2013.

2.4.2 Municipal areas

Table-6: Source: District Statistical Hand Book, 2013

Parameters	Total population	Total number of services	Population served by each individual parameters	Scores
Hospital	4971753	13	382443	185
Bed		2407		1

Table-7: Source: District Statistical Hand Book, 2013

Municipalities	Hospital	Beds	Total Score
Bongaon	185.15	300.00	485.15
Habra	185.15	131.00	316.15
Gobardanga	0.00	0.00	0.00
Ashokenagar-Kalyangarh	185.15	60.00	245.15
Barasat	185.15	600.00	785.15
Madhyamgram	0.00	0.00	0.00
Rajarhat-Gopalpur	0.00	0.00	0.00
Kanchrapara	0.00	0.00	0.00
Halisahar	0.00	0.00	0.00
Naihati	185.15	131.00	316.15
Bhatpara	185.15	134.00	319.15
Garulia	0.00	0.00	0.00
North Barrackpur	0.00	0.00	0.00
Barrackpur	185.15	252.00	437.15
Titagarh	0.00	0.00	0.00
Khardah	185.15	100.00	285.15
Panihati	185.15	150.00	335.15

New Barrackpur	0.00	0.00	0.00
Kamarhati	185.15	131.00	316.15
Baranagar	185.15	118.00	303.15
Dum Dum	0.00	0.00	0.00
South Dum Dum	0.00	0.00	0.00
North Dum Dum	0.00	0.00	0.00
Bidhannagar	185.15	100.00	285.15
Baduria	0.00	0.00	0.00
Taki	0.00	0.00	0.00
Basirhat	185.15	200.00	385.15

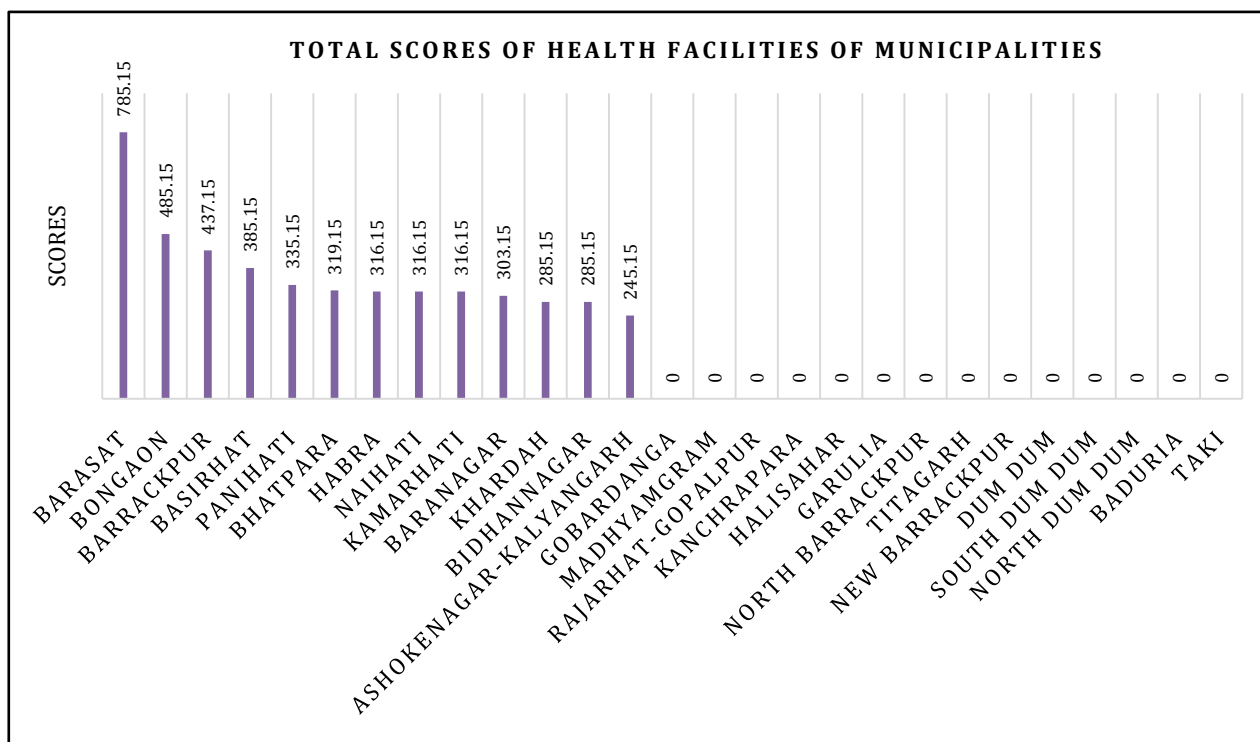


Fig- 6: Source: District Statistical Hand Book, 2013.

Total scores of health facilities of Municipalities have also been calculated. On the basis of this Municipalities are ranked. It has been found that according to total score Barasat Municipality scores 785.15 which is far from others. Then comes Bongaon having score 485.15 followed by Barrackpur, Bashirhat, Panihati, Bhatpara, Habra, Naihati, Kamarhati, Baranagar, Khardah, Bidhannagar and Ashok nagar-Kalyangar Municipality. (Fig -6)

3. CONCLUSIONS

So it has been found that health infrastructure is not equal in all regions. There is heavy population pressure on each facilities provided. Municipal areas are comparatively standing at better position having high values of mean and standard deviation than C D Blocks in respect of occurrences of hospitals and number of beds.

If all C D Blocks it has been found the condition of Baduria is very good in terms of government sponsored health infrastructures. Hansnabad’s condition is also good. Situation of Bagdah, Swarupnagar, Gaihata, Barasat II, Sandesh khali II are more or less close and have moderate condition regarding health infrastructure. The condition of Minakhan, Hingalganj, Bongaon, Deganga, Amdanga, Rajarhat, Sandeshkahali I are not so good but the condition of Barasat I, Basirhat II, Haroa, Habra II, Habra I, Barackpur I, Barackpur II and Basirhat are very poor(Table- 5).

Among the Municipal areas it has been found the condition of Barasat is very good among others and the infrastructural condition is far beyond than other Municipalities. Bongaon and Barrackpur have also good situation than rests. Municipalities like Bashirhat, Panihati, Bhatpara, Habra, Naihati, Kamarhati, Baranagar, Khardah,

Bidhannagar and Ashoknagar-Kalyangar Municipality have scores nearer to each other's. But in rest of the municipalities the situation is very poor as any level of government health care structure have not been found there. (Table- 7)

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